

Department of Natural Resources (DNR)

Region or Bureau
South Central Region

Type List Designation
Type II

Larson Acres, Inc (revised 8-14-09)

NOTE TO REVIEWERS: This document is a DNR environmental analysis that evaluates probable environmental effects and decides on the need for an EIS. The attached analysis includes a description of the proposal and the affected environment. The DNR has reviewed the attachments and, upon certification, accepts responsibility for their scope and content to fulfill requirements in s. NR 150.22, Wis. Adm. Code. Your comments should address completeness, accuracy or the EIS decision. For your comments to be considered, they must be received by the contact person before 4:30 p.m., [August 10, 2009](#).

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Date: August 14, 2009 (revised)

Applicant: Larson Acres, Inc.

Address: 18218 W. State Road 59, Evansville, WI 53536

Title of Proposal: Larson Acres, Inc.

Location: County: Rock City/Town/Village: Town of Magnolia

Township Range Section(s): Township 3 North, Range 10 East, SE ¼, NW ¼, Sections 7 and 29

SECTION 1 - PROJECT SUMMARY

1. General Description

This environmental analysis (EA) fulfills part of the Wisconsin Department of Natural Resources (DNR) requirements under the Wisconsin Environmental Policy Act (WEPA), Wis. Stat. § 1.11 and Chapter NR 150, Wis. Adm. Code. WEPA requires state agencies to consider environmental factors when making decisions to approve or deny Wisconsin Pollution Discharge Elimination System permit applications as well as Plans and Specification Approvals for industrial wastewater facilities. The purpose of this EA is to provide decisions makers, the public and other stakeholders with an analysis of the economic, social, cultural, and environmental impacts that could result from the proposed expansion of an existing Confined Animal Feeding Operation (CAFO) dairy owned and operated by Larson Acres, Inc.

Larson Acres operates two dairy facilities; the Main Facility is located on 18218 W Highway 59 in Evansville,

Wisconsin and the Heifer Facility, located at 17162 W County Road B, Brodhead, Wisconsin, see Figures 1 and 2.

The WPDES permit application includes the combined operation of both facilities and the Plan and Specification approval. If Larson Acres' Plans and Specifications for the expanded Main Facility and Wisconsin Pollutant Discharge Elimination System (WPDES) permit application for the entire business is approved by WDNR, both facilities will operate pursuant to one proposed WPDES permit. As such, both facilities are addressed in this EA.

Larson Acres is a large dairy operation that is currently operating pursuant to an expired WPDES permit issued on June 30, 2000. Prior to issuing the original WPDES permit, the Department conducted an EA to address potential impacts of a proposed expansion at the Main Facility. That expansion has since been completed. Background information about operations at the Main Facility can be found in the expired WPDES permit and prior EA.

In 2003, Larson Acres filed an application to renew its WPDES permit. That application allowed them to continue to lawfully operate with an expired permit. The 2003 renewal application included a proposal to construct the Heifer Facility. Construction of the Heifer Facility has since been completed. Since the 2003 renewal application was filed, Larson Acres has developed additional plans that include an expansion at the Main Facility. After completion of the proposed expansion, the proposed Farm will generally consist of the Main and Heifer Facilities and 3,925 acres of land covered under the Farm's Nutrient Management Plan. The Department intends to reissue a WPDES permit to include both the Heifer facility and the Main Facility, including the proposed expansion at the Main Facility.

Larson Acres, Inc currently operates a 2,668 animal (2,920 animal units) dairy at 18218 W Highway 59 in Evansville (Main Facility) and a Heifer Facility, located at 17162 West County Road B, Brodhead, Wisconsin. Larson Acres proposes to construct new buildings, add 2,607 animals (2,660 animal units) and expand the current wastewater treatment system at the Main Facility. The proposed total number of animals at both facilities is 5,275 animals (5,580 animal units).

Additional details describing Larson Acres dairy operation are provided within the attached WPDES permit application.

Heifer Facility

Larson Acres constructed a free-stall heifer rearing operation in Magnolia Township, Town 3 North, Range 10 East, SE 1/4, SE 1/4, Section 29 in 2003. The facility consists of a 600' X 112' slatted floor free stall barn with 889 stalls. Manure is collected through slatted floors and stored below the barn in a 4.8 million gallon concrete manure storage facility. The free stall barn currently houses dry cows and heifers. The cost of this expansion was approximately \$1,539,000.00. Additional details and a diagram of this facility are provided within the attached WPDES permit application.

The Heifer Facility provides the necessary on-farm infrastructure for the rearing of dairy herd replacement stock. Manure from the Heifer Facility is also incorporated into the total farm nutrient management plan. As such, even though the Heifer Facility is at a location different than the Main Facility, it will be included as part of the farm regulated by the existing WPDES permit. After the Main Facility expansion is complete, the dry cows at the Heifer Facility will be moved to the Main Facility. There is no plan to expand the Heifer Facility at this time. Detailed information on the number of animals at each facility is available in the permit application. Additional details and a diagram of this facility are provided within the attached WPDES permit application.

Figure 1. Larson Acres – Town of Magnolia

Figure 1. Larson Acres – Town of Magnolia

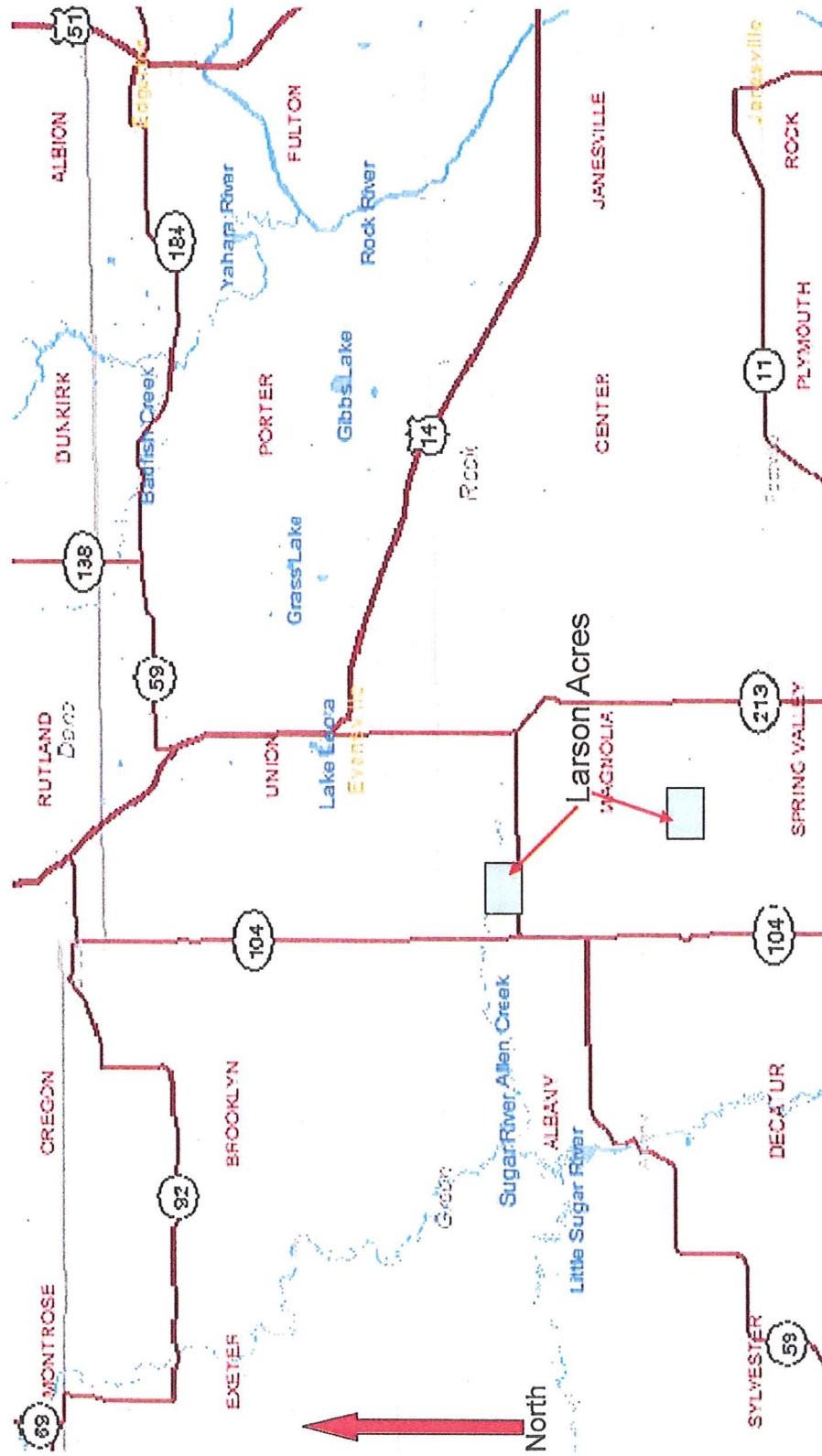
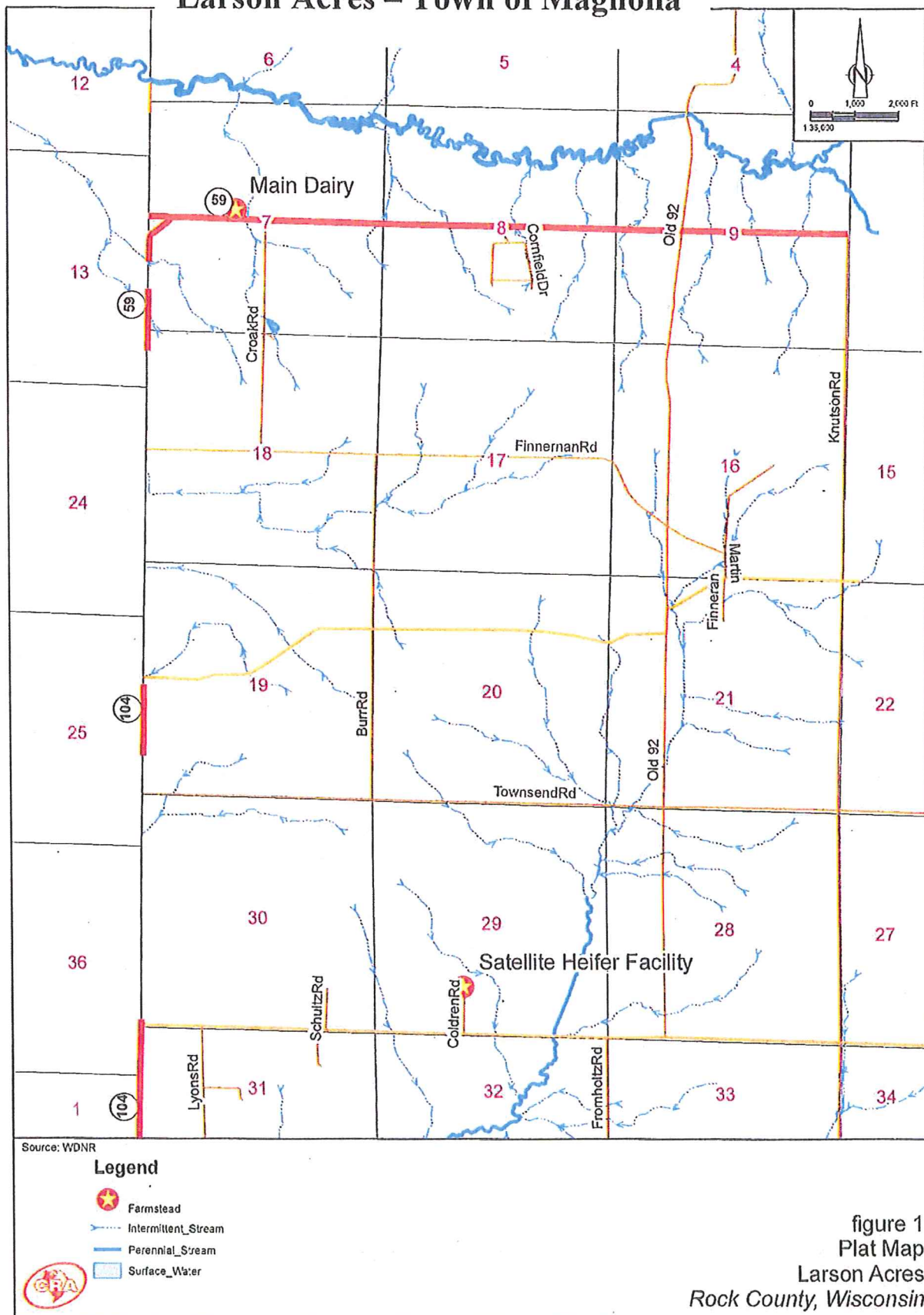


Figure 2
Larson Acres – Town of Magnolia



On February 12, 2008, the Department determined the Heifer Facility, including the manure storage structure, was constructed in accordance with NRCS Standard 313. Additional information regarding this issue is addressed in the file record.

Main Facility and Proposed Expansion

The Main Facility, located in Township 3 North, Range 1 East, SE 1/4, NW 1/4, of Section 7, currently has 1,666 milking cows, dairy calves, and springing heifers (1,996.5 animal units). The Main Facility features sand freestall housing for adult cows in two four-row barns, a 156-stall special needs barn, a holding area and double-22 milking parlor, a calf barn and heifer shed, farm shop, machine shed, and a feed storage area with concrete feed bunkers. The Main Facility has two earthen basin manure storage lagoons: one with 12 million gallons of storage capacity and one with 5.4 million gallons of storage capacity. These manure storage lagoons are emptied twice a year.

The proposed expansion at the Main Facility will include the construction of a cross ventilated freestall barn, milking parlor, four nursery barns for newborn calves, a solids stacking slab, a youngstock barn, additional feed storage and an expanded silage leachate containment/treatment system. Construction of the proposed expansion is scheduled to begin in 2009 and should be completed in 2010. Plans and specifications for the reviewable structures were submitted May 18th, 2009 and are currently under review by the Department. After the expansion at the Main Facility, the operation will house an additional 2,407 animal units when at full capacity (total of 5,580 animal units). The additional animals will come from both inside and outside of the current operation. Other animals will be bought from outside herds and added to Larson Acres herd in accordance with the farm's biosecurity plan. The expansion will include installing an additional McLanahan Sand Separator and a manure transfer system. The sand will be separated at the new facility and the remaining manure / waste will be transferred to the Integrated Separated Solutions NuWay Sustainable Nutrient Management system ("ISS system") ISS system that is currently in place at the Main Farm.

Management of the additional manure produced by the additional animals is addressed in Larson Acres' nutrient management plan. The nutrient management plan was submitted to the Department for review and approval in March 2009; an updated nutrient management plan was submitted on June 11, 2009. The completed nutrient management plan is currently under review by the DNR. The estimated cost of the proposed expansion is \$ 12.8 million. Detailed information concerning the proposed expansion can be found in the attached Environmental Assessment Questionnaire, submitted by Larson Acres on May 18, 2009.

Larson Acres currently has several approved high capacity wells. The proposed expansion includes the addition of two additional high capacity wells. High capacity well approval is required for operations using 70 gallons/minute or more from operator-owned wells per s. 281.34 Wis. Stats. Larson Acres will apply for approval of the two proposed high capacity wells. We have attached a list of their current high capacity wells.

Additional details and a diagram of this facility, including the location of the high capacity wells, are provided within the WPDES permit application.

Main Facility Wastewater Treatment System

Larson Acres, Inc. has installed and is currently operating an Integrated Separated Solutions NuWay Sustainable Nutrient Management system ("ISS system"). The ISS system separates manure into solid and liquid byproducts and ultimately produces four waste products: reusable sand, high nutrient-content dry manure solids, a high nutrient-content liquid byproduct, and a low nutrient-content liquid byproduct. Under Ch NR 108, the Department reviewed plans and specifications for the treatment system pipelines and approved these plans on August 13, 2007. See the compliance section for more details.

The ISS system uses multiple processing phases to effectively separate manure into four distinct byproducts. First, manure goes through a McLanahan mechanical sand separator to remove 95% of the sand particles from the dairy manure. This sand is then de-watered and reused as bedding in free stall barns within 3 days. Next, the manure is pumped to the first phase of the ISS system called NuSep. This stage removes 30-35 % of total solids. These are the larger solids found in manure. Manure is sent to the second phase called NuSpin. This stage uses high G-forces to remove another 25% of the remaining solids. This stage eliminates fine solids, sand, and grit in the manure and removes nearly half of the remaining phosphorus. This solid by-product is high in phosphorus and nitrogen. The third phase is called NuCleanse. This phase uses a chemical-free membrane technology to remove 100% of suspended solids from the liquid byproduct. This results in a low volume of high nutrient- content, semi-solid material that can be stored for later field application, and a low-nutrient content byproduct called "tea-water" that may be used to irrigate crops. This "tea water" has been tested and found to have a reduction in phosphorus from a book value of 5 lbs/1,000 gallons to 0.25 lbs/1,000 gallons and a reduction in nitrogen from a book value of 7 lbs/1000 gallons to 2.39 lbs/1000 gallons and is also lower in odor. The fourth phase of the ISS system, reverse osmosis, is not yet installed at Larson Acres' facility. Larson Acres is exploring the possibility of installing this technology because it may remove more impurities from the liquid byproduct than a municipal wastewater treatment facility would remove. The resulting water could potentially be discharged into the watershed with Department approval or used at the operation for cleaning and washing parlor areas. Surface water discharge is not proposed at this time. Larson Acres plans to continue researching this technology to determine whether it can be integrated into their operations.

The ISS wastewater treatment system has the following benefits:

- Allows for the recycling of sand for use as bedding
- Allows for safer application of manure solids for reuse as a fertilizer and soil conditioner
- Replaces most of the fresh water used in the previous system with recycled water
- Reduces potential risk of hauling liquid manure in over-the-road tankers
- Reduces the volume of liquid manure that must be stored at the site and landspread on crop lands
- Optimizes nutrient content of manure for use as fertilizer

Pursuant to NR 243.15(6), Wis. Adm., Code, Larson Acres will be seeking approval to apply, manage and utilize tea water from the ISS system through a center pivot irrigation system. Teawater will be utilized on a number of fields in the nutrient management plan through traditional land application methods; however, at this time Larson Acres is only seeking approval to spray irrigate tea water on one field. A preliminary proposal has been submitted called "Updated Proposal for Approval of a Field for the Application of Tea Water from a Wastewater Treatment System", Conestoga-Rovers, July 13, 2009. Additionally, a revised Groundwater Monitoring Workplan was submitted on July 14, 2009 and includes the information required by NR 214.14, .20, and .21, Wis. Adm. Code regarding spray irrigation systems, site investigation and groundwater sampling. A final set of plans and specifications will be submitted for department approval. Larson Acres is currently operating this system under their current nutrient management plan on a trial basis in conjunction with University of Wisconsin Extension. The tea water application will be made via an existing center pivot irrigation system with drop nozzles. The goal is to increase efficiency of crop nutrient utilization by applying appropriate levels of nutrients throughout the growing season.

The field selected for the tea water application is approximately 149 acres in size and the coverage by irrigation equipment is 132 acres. The field is approximately 0.25 miles south of the Main Dairy Facility. Portions of the field have field tile installed at depth of 36 inches to 48 inches below ground surface. All tile lines outlet in one of two locations within the field. Additional information regarding this field is located in the "UPDATED: Proposal for Approval of a Field for the Application of Tea Water from a Wastewater Treatment System", Conestoga-Rovers, July 13, 2009.

Remote soil moisture sensors have been installed throughout the field proposed for tea water irrigation. Soil moisture sensors indicate the relative saturation of the field at any specific moment in time. This technology will assist Larson Acres and University of Wisconsin-Extension in planning tea water applications so the plant can best utilize the nutrients as well as reduce the risk that tea water will infiltrate field tiles.

Larson Acres is currently voluntarily sampling the tea water for nutrients and will continue the sampling as part of the UW Extension research effort. Soil sampling is also routinely conducted as part of the nutrient management plan and this will continue with respect to the dedicated spray irrigation system. Larson Acres has submitted a proposal to monitor groundwater for this system. Initially, Larson Acres would install three groundwater monitoring wells to allow sampling groundwater under the field. Initial sampling of the groundwater monitoring wells would be on a quarterly basis and include monitoring of groundwater levels in the wells to determine groundwater flow direction and the following analytical tests:

- Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Chloride, Total Nitrogen-Ammonia (NH₃ as N), Total Kjeldahl Nitrogen (TKN), Nitrogen-Nitrate+Nitrate, pH and Total Coliform.

Additional information regarding this proposal effort can be found in the WPDES permit, the UPDATED: Proposal for Approval of a Field for the Application of Tea Water from a Wastewater Treatment System”, Conestoga-Rovers, July 13, 2009 and the aforementioned Groundwater Monitoring Workplan. The Department is reviewing these submittals as part of the WPDES permit review process.

2. Permit Compliance

As part of the permit issuance process, the Department will be reviewing the compliance history for this operation and making a determination of substantial compliance. Any past real or perceived procedural issues regarding the Department’s approval process and Larson Acres construction activity/timelines will be addressed during on-going WPDES permit compliance efforts. The Department will work with Larson Acres to ensure all pertinent Wisconsin Statutes and Administrative Codes are followed.

3. DNR Authorities

The Department of Natural Resources has the following authorities regarding the Larson Acres dairy operation:

- Wisconsin Pollutant Discharge Elimination System (WPDES) Permits for Concentrated Animal Feeding Operations (CAFO), under s. 283, Wis. Stats and ch. NR 243, Wis. Adm. Code
- Wisconsin Pollution Discharge Eliminations System (WPDES) Permits for Concentrated Animal Feeding Operations (CAFO), i.e. those operations with 1,000 animal units or more
- Review and approval authority of manure storage facilities, transfer systems, feed storage and runoff control systems—s. 281.16, Wis. Stats.
- Nutrient Management Plan review, ch. Nr 243, Wis. Adm. Code and NRCS technical standard 590
- Environmental Analysis and Review Procedures for Department Actions, NR 150, Wis. Adm. Code
- Emission limitations from s. NR 415.04, Wis. Adm.. Code, covering fugitive dust sources and s. NR 415.05, Wis. Adm.. Code, covering emissions of particulate matter from processes
- Odor control requirements may be imposed by order of the Department if the Department determines that a violation of s. NR 429.03 – Malodorous Emissions, Wis. Adm.. Code, occurs
- High capacity well approval for operations using 70 gallons/minute or more from operator-owned wells, or temporary dewatering approval for operations pumping 70 gallons/minute during construction only—s. 281.34, Wis. Stats.
- If construction activities disturb one or more acres, the operation must obtain a storm water construction permit (WI-0067831-1) per NR 216, Wis. Adm.. Code
- Massive failure of manure storage facilities per NR 706, Wis. Adm.. Code

- NR 108, Wis. Adm.. Code, review and approval authority of manure storage facilities and runoff control systems
- Nutrient Management Plan review and approval
- Annual Spreading Report review and approval

4. Documents, plans, studies or memos developed to support this proposal include:

- Larson Acres Nutrient Management Plan prepared by Dennis McGuire and Eric Galdi of Landmark Services Cooperative (June 11, 2009)
- Wisconsin Pollutant Discharge Elimination System (WPDES) Permit Application (as amended) (May 18, 2009)
- Environmental Analysis Questionnaire for Livestock Operations completed by Ed Larson (May 18, 2009)
- Larson Acres expired WPDES permit (June 30, 2000)
- Larson Acres Environmental Assessment (June 28, 2000)
- Larson Acres WPDES permit renewal application (August 2003)
- Construction documentation of waste storage facility submitted by Daniel Jensen of Wieser Concrete Products, Inc.
- Larson Acres proposed Tile Line Management Plan (Draft) submitted by Ed Larson (July 14, 2009)
- Animal Waste Treatment System Pipelines Design Report prepared by Bob Pofahl of Resource Engineering Associates, Inc. (July 10, 2007)
- Application for Local Approval submitted by Bob Pofahl of Resource Engineering Associates, Inc. (February 26, 2007)
- Conditional Approval of Design Plans and Specifications prepared by Terry Donovan (DNR) (August 13, 2007)
- Town of Magnolia Town Board Meeting Transcript of Proceedings by Linda Kuhlman (March 10, 2007)
- Town of Magnolia Groundwater Study prepared by Peter J. Taglia, P.G. (February 2007)
- Technical Review prepared by Jason Haezle, P.E. of Conestoga-Rovers & Associates (December 12, 2006)
- Field Tile Sampling Review prepared by Jason Haezle, P.E. of Conestoga-Rovers & Associates (January 23, 2007)
- Drinking Water Test Results-Magnolia Township, Rock County submitted by Dr. Joseph Schurhammer, DVM of Rock County Health Department (February 26, 2007)
- Review of Groundwater Data prepared by Jeff Postle (DATCP), Steve Ales (DNR), and Chuck Warzecha (DHFS) (April 10, 2007)
- Department findings on biological impacts to Norwegian Creek, Jim Amrhein (DNR)
- Letters of concern from: Tony and Dela Ends, Stephen and Lea Watson, John and Linda Adams, Michael and Anne Johnson, Anna Richmond, Richard and Darlene Massen, Verne and Rosemary Wilke, Suellen Thomson-Link, Jerry and Ellyn Popanz
- Detecting and Mitigating the Environmental Impact of Fecal Pathogens Originating from Confined Animal Feeding Operations: Review, Dr. Shane Rogers and Dr. John Haines, Land Remediation and Pollution Control Division (EPA), (September 2005)
- Best Management Practices for Pathogen Control in Manure Management Systems, Mindy Spiehs and Sagar Goyal of the University of Minnesota Extension (2007)
- Emails from Michael Murray (DATCP) about the siting permit (October 22, 2007)
- Docket No. 07-L-01 Decision, State of Wisconsin Livestock Facility Siting Review Board (August 17, 2007)
- Correspondence: Town of Magnolia (Reynolds & Associates) to DNR, August 29, 2008

- Nutrient Management Fast Facts. Nutrient and Pest Management (September 2007)

5. Attachments

- #1-Environmental Analysis Questionnaire, Conestoga Rovers & Associates (May 19, 2009)
- #2-WPDES Permit Application – electronic version (May 19, 2009)
- #3-Plans and Specifications for expansion – electronic version (May 19, 2009)
- #4-Tile Line Fact Sheet (July 2009)
- #5-Larson Acres Animal Waste Permit Factsheet (December 4, 2006)
- #6-DNR Drinking Water System: High Capacity Well Table
- #7-Correspondence: DNR to Larson Acres – Heifer Facility Letter (February 12, 2008)
- #8-Correspondence: Larson Acres (Michael Best & Friedrich LLP) to DNR (April 2, 2008)
- #9-Updated Application of Tea Water from WWTS, Conestoga Rovers & Associates (July 13, 2009)
- #10-Groundwater Monitoring Work Plan – Revised, Conestoga Rover & Associates (July 13, 2009)
- #11 Addendum #1 – Summary of Public Comments & Department Response (August 14, 2009)
- #12 Addendum #2 – Record of Revisions Made to Environmental Assessment (August 14, 2009)
- #13 Norwegian Creek – Index of Biotic Integrity & Hilsenhoff Biotic Index by Jim Amhrein (undated)
- #14 Correspondence: EA Comments - Green-Rock Citizens for Clean Water (Garvey, McNeil & Assoc.) to DNR (received August 10, 2009)
- #15 Correspondence: E-mail DNR to Green-Rock Citizens for Clean Water (July 21, 2009)
- #16 Correspondence: EA – Comments - Larson Acres (Michael Best & Friedrich LLP) to DNR (August 10, 2009)
- #17 “Well Protected?”, (article) Wisconsin State Journal (July 26, 2009)

SECTION 2 - DNR EVALUATION – ENVIRONMENTAL EFFECTS

1. Physical Impacts

1(a). Physical Impacts – Heifer Facility

Prior to construction of the Heifer Facility, the site had been used for cropland or other agricultural related purposes. The construction of the Heifer Facility resulted in the conversion of the land from one type of agricultural use to another. Approximately 28,000 cubic yards of land have been moved as a direct result of the construction of the Heifer Facility and the development of the operation. Short-term physical impacts were primarily associated with construction activities at the site. Storm water runoff from the site during the construction phase could have resulted in environmental impacts such as silt and sediment being transported to area wetlands and surface waters; however, proper methods were used to minimize these potential impacts.

Because the project resulted in the disturbance of less than five acres, Larson Acres was not required to obtain coverage under the WPDES storm water construction site general permit (WI-0067831-3) in effect at the time of construction.

Long-term physical impacts include visual impacts. Construction of the Heifer Facility has resulted in visual changes at the site. Some increases in noise and some dust associated with increased traffic and general operations have been experienced. Road access to the facility is being managed in a way that minimizes the increased disturbance from noise and dust to area residents and their properties.

Given that much of the land in the area is used for agriculture and is relatively sparsely populated, increased traffic and visual impacts are not considered to be significant. In addition, while the physical appearance of the site has been substantially changed, the use of the site will remain agricultural in nature.

1(b). Physical Impacts – Main Facility

The expansion area at the Main Facility is currently used for cropland and other agriculture related purposes. Short-term physical impacts could include storm water runoff from the site during the construction phase. Since construction of the proposed expansion will disturb more than one acre of soil, Larson Acres has obtained a Construction Site Storm Water Runoff permit (Storm Water Permit FIN 41259). The Department's Construction Site Erosion Control permit requires the operation to implement best management practices (BMPs) to address impacts from storm water runoff. Stormwater runoff controls must be in place to control and manage runoff due to rainfall and snowmelt events. The required BMPs should minimize siltation and sediment delivery from the construction site and prevent silt and sediment from reaching wetlands and surface waters. A copy of the permit is attached and the application can be viewed upon request.

Long-term physical impacts will include visual changes. The proposed expansion will include the construction of a new building on an existing agriculture field, and the construction of a driveway connecting the existing buildings at the Main Facility to the new building. Some increases in noise and some dust associated with increased traffic and general operations will be experienced. Currently, the dairy estimates that approximately 3,500 truckloads of feed, manure, supplies, etc. enter and exit the dairy each year. Following the expansion, the number of truck loads will increase to 7,000 annually. The use of internal driveways on the farm property between the dairy complexes will help reduce the amount of traffic on State Road 59. Road access to the facility will be managed in a way that minimizes the increased noise and dust that may arise from increased traffic.

Sand is to be used for animal bedding material. The manure handling system will include a sand separator that is expected to allow for 95% reuse of the sand for animal bedding. This will reduce the amount of replacement sand needed along with reducing the amount of energy that would be required to mine and haul the sand. It will also reduce hauling traffic.

Given that much of the land in the area is used for agriculture and is relatively sparsely populated, increased traffic and visual impacts are not considered to be significant. In addition, while the physical appearance of the site has been substantially changed, the use of the site will remain agricultural in nature.

2. Air Quality Impacts

2(a). Ambient Air Emissions

Livestock operations result in ambient air emissions. Sources of air emissions from livestock operations include the livestock themselves, manure handling and storage, land application of manure, as well as vehicles and vehicle traffic, grain and feed handling, grain drying, grain storage, feed milling, feed storage, fertilizer and pesticide handling and application. The most commonly noted form of air pollution associated with livestock operations is odor. In addition, livestock operations result in air emissions of particulate matter and various hazardous air pollutants, especially hydrogen sulfide and ammonia. Larson Acres does not currently dry grain or operate a feed mill.

In 2003, the National Academy of Sciences (NAS), National Research Council, published a comprehensive report, "Air Emissions From Animal Feeding Operations: Current Knowledge, Future Needs." The key findings relevant to this assessment include the following: 1) Standardized methodologies for odor measurement have not been adopted in the United States, and 2) Estimating air emissions from animal feeding

operations by multiplying the number of animal units by existing emission factors is not appropriate for most substances. As noted in this report, the existing emission factors for animal feeding operations are generally inadequate because of limited numbers of measurements on which they are based, as well as the limited generality of the models for which the emission factors have been developed. The NAS recommends that the science be strengthened, that a standardized odor measurement methodology be adopted, and that a process-based emissions estimation methodology be developed.

In response to these findings and recommendations, the United State Environmental Protection Agency (US EPA) has initiated a national effort to develop an emissions estimation methodology for animal feeding operations, through US EPAs Animal Feeding Operation Air Quality Compliance Agreement. Emissions monitoring will occur at farms that sign on to the agreement. These farms will represent major animal groups (e.g. swine, dairy, and poultry), different types of operations, and different geographic regions. The sign-up period for this agreement ended in August 12, 2005. The monitoring study, expected to end in 2009, will provide EPA with the essential data needed to develop emissions estimating methods and tools, which will assist the industry and EPA in determining the air impact and compliance status of animal feeding operations. EPA is required to publish the methodology and tools for estimating emissions within 18 months of the end of the monitoring study. Under the current timeline for study completion, the methodology would be published in January 2011. Animal feeding operations will then be required to determine their emissions and comply with all applicable regulatory requirements. Pollutants to be monitored include particulate matter (PM) (TSP, PM10 and PM2.5), hydrogen sulfide (H₂S), volatile organic compounds (VOCs), and ammonia (NH₃).

In the interim, a limited number of other states have adopted methodologies to evaluate the potential air impacts of livestock operations. For example, the Minnesota Pollution Control Agency (MPCA) has adopted an air quality impact analysis methodology. The MPCA environmental assessment methodology for livestock operations is established in law and is supported by guidance materials developed by the MPCA as part of their environmental assessment program. The Department has not adopted this methodology and does not typically conduct analysis of air emissions from CAFOs. Instead the Department has made a conscious decision to coordinate its work in this area with the outcome of the national monitoring effort described above.

2(b). Odor

As noted above, standardized methodologies for odor measurement have not been adopted in the United States. The Department has not adopted a methodology to predict the potential odor impact of proposed livestock operations. Thus a quantification of predicted odor impact of the proposed project is not included in this assessment. Wisconsin's odor rule is established in s. NR 429.03, Wis. Adm. Code. This rule establishes general limitations on objectionable odor, defines the tests for what constitutes objectionable odor, and sets abatement or control requirements.

The operation has applied for local approval of its proposed expansion and submitted an odor management worksheet as part of the local approval process in accordance with a local ordinance and ch. ATCP 51, Wis. Adm. Code. As part of this process, an odor management worksheet and supporting documentation will be submitted to the town. The operation will be identifying odor control practices as part of its application for local approval.

Note: Odor from land applied manure should be reduced because of required incorporation timing, or applications to actively growing crops, as commonly required in all Nutrient Management Plans.

2(c). Particulate Matter & Fugitive Dust

As noted above, a national effort to develop an emissions estimation methodology for animal feeding operations

is underway, as established with the EPA Animal Feeding Operation Air Quality Compliance Agreement. The monitoring protocol includes measurement of particulate matter (TSP, PM10, and PM2.5). Wisconsin's fugitive dust rule, s. NR 415.04, Wis. Adm. Code, establishes general limitations on fugitive dust and sets specific precautions for limiting fugitive dust emissions. Ambient air quality standards for particulate matter are established in s. NR 404.04, Wis. Adm. Code. These standards are established at levels protective of public health and welfare. The primary standards for PM10 are 150 micrograms per cubic meter - maximum 24-hour concentration not to be exceeded more than once per year, and 50 micrograms per cubic meter - annual arithmetic mean. The secondary standard for total suspended particulate matter is 150 micrograms per cubic meter - maximum 24-hour concentration, not to be exceeded more than once per year. An ambient air quality standard for fine particulate matter (PM2.5) has been established at the federal level. The federal PM2.5 standards are $15.0 \mu\text{g}/\text{m}^3$, annual arithmetic mean, and $35 \mu\text{g}/\text{m}^3$, 24-hour average. As of this writing, there are no particulate matter non-attainment areas in Wisconsin.

Dust from gravel driveway may be generated during periods of construction and routine traffic and can be controlled with the implementation of a watering program. Dust control measures, including proper construction and watering of driveways, are outlined in the Odor Management Plan submitted with Larson Acres' application for local approval of the proposed expansion.

2(d). Hazardous Air Pollutants:

As noted above, a national effort to develop an emissions estimation methodology for animal feeding operations is underway, as established with the EPA Animal Feeding Operation Air Quality Compliance Agreement. The monitoring protocol includes measurement of hazardous air pollutants, specifically hydrogen sulfide and ammonia.

In Wisconsin, hazardous air pollutant emissions are regulated under ch. NR 445, Wis. Adm. Code. This rule establishes ambient air standards for specific hazardous air pollutants, off the source's property. The criteria for determining which pollutants are regulated and how the standards are established is set in s. NR 445.13, Wis. Adm. Code. The criteria include conditions based on determinations by the International Agency for Research on Cancer, the National Toxicology Program, the American Conference of Governmental Industrial Hygienists, and the US EPA.

An updated version of ch. NR 445, Wis. Adm. Code, was published on July 1, 2004. The July 2004 version of this rule provided a 36-month exemption for livestock operations to come into compliance; this exemption was scheduled to expire in June 2007. However, in 2008, the Natural Resources Board voted to extend the exemption to 2011 to coincide with the completion of USEPA's national study on air pollutants from CAFOs. The extension to 2011 was approved, and the revision to NR 445 providing the extension was enacted in 2008.

As described above, US EPA is working to create an emissions estimation methodology for animal production areas through its Animal Feeding Operation Air Quality Compliance Agreement. In addition, the Department is working with other state agencies and organizations to study the effectiveness of various best management practices at animal production areas to control emissions and odors from a number of livestock operations across the state. The results of these studies will help support implementation of the NR 445 requirements. After this exemption period, new livestock operations are required to comply upon start up and existing livestock operations will have an additional 12 months to comply. The rule provides several compliance options, including demonstration of compliance via dispersion modeling analysis. A special compliance option for livestock operations is established in the updated rule, specifically, the implementation of best management practices as approved by the Department.

As stated in a note within s. NR 445.08(3)(c), Wis. Adm. Code, NR 445 was not developed with the purpose of regulating emissions of hazardous air contaminants associated with agricultural waste or byproducts. The

Department believes that using best management practices is the preferred approach to regulate and control emissions from these types of sources.

Over the past several years, in response to complaints about air pollution associated with livestock operations, the Department has conducted a limited amount of ambient air monitoring for hazardous air pollutants near a variety livestock operations. The monitored concentrations have not exceeded the acceptable ambient concentration standards established in ch. NR 445, Wis. Adm. Code. As established in ch. NR 445, Wis. Adm. Code, the acceptable ambient concentration for ammonia and hydrogen sulfide are 418 and 335 micrograms per cubic meter, respectively, both on a 24 hour average basis, per. ch. NR 445. The Department continues to engage in ambient monitoring for these compounds at livestock operations.

3. Biological Impacts

3(a). Threatened & Endangered Species

Mike Halsted, Department Environmental Analysis & Review Specialist, concluded no threatened or endangered species are present near the construction site for the proposed expansion of the Main Facility nor do such species exist in the vicinity of the Heifer Facility. However, the following fish is listed as Special Concern and has been confirmed in both Allen and Norwegian creeks.

Least Darter (*Etheostoma microperca*), a fish listed as Special Concern, prefers clear, warm, quiet waters of overflow ponds, pools, lakes and streams over substrates of gravel, silt, sand, boulders, mud or clay with dense vegetation or filamentous algal beds. Spawning occurs from late April through July.

Note: Special Concern species are those about which some problem of abundance or distribution is suspected but not yet proven. The main purpose of this category is to focus attention on certain species before they become Endangered or Threatened.

3(b). Aquatic Habitat

All or portions of Allen and Norwegian creeks are also classified as Exceptional Resource Waters per NR 102, Wis. Adm. Code. Waters classified as Exceptional Resource Waters include surface waters which provide valuable fisheries, hydrologically or geologically unique features, outstanding recreational opportunities, unique environmental settings, and which are not significantly impacted by human activities.

Allen Creek: Allen Creek, which is located approximately 2,500 feet north of the Main Facility is classified as an exceptional resource water in Rock County. The Allen Creek fishery in the vicinity of Larson Acres contains a wide variety of minnow species, brown trout, catfish and smallmouth bass. Minnow species found in various reaches in the creek include the aforementioned Least Darter. While brown trout species have been found in the waters within Larson Acres property, this portion has not been officially classified as a trout stream. However, Allen Creek is a listed Class II & Class III trout stream beginning at Old 92 and extending two miles upstream up stream to Highway 104 in the Town of Union near the intersection of Rock, Green and Dane counties (source WDNR – Watershed DataViewer).

The Department has also documented that a population of Rusty Crayfish (*Orconectes rusticus*) has invaded many portions of Allen Creek. Though native to the Ohio River basin; Wisconsin and other states have determined that populations of Rusty Crayfish displace species native to Wisconsin waters and cause a variety of ecological problems. The proposed project will have no positive or negative effect on this invasive species.

Overall, Allen Creek should not be negatively impacted by the project provided;

- (1) construction site best management practices are used
- (2) manure landspreading is limited to existing croplands
- (3) manure application practices avoid increased nutrient loading to surface waters
- (4) Larson Acres operates within the limits of their forthcoming WPDES permit
- (5) Larson Acres operates according to an approved Nutrient Management Plan.

See additional discussion regarding the potential impacts to surface waters and see various figures in the attached WPDES Permit Application for the location of Allen Creek in relationship to the proposed expansion of Larson Acre's Main Facility.

Norwegian Creek: Norwegian Creek is considered an excellent forage fishery and is only classified as an exceptional resource water in Green County. The reach adjacent to the Heifer Facility in Rock County does meet the definition of a cold water resource but is not on the exceptional resource waters list. Norwegian Creek contains a wide variety of minnow species (including the Least Darter), macroinvertebrates and is known to host an occasional largemouth bass and/or northern pike. Department lead studies have shown that the water quality in Norwegian Creek is good near the Heifer Facility. (See Attachment #13 for more information)

Overall, Norwegian Creek should not be negatively impacted by the project provided;

- (1) construction site best management practices are used
- (2) manure landspreading is limited to existing croplands
- (3) manure application practices avoid increased nutrient loading to surface waters
- (4) Larson Acres operates within the limits of their forthcoming WPDES permit
- (5) Larson Acres operates according to an approved Nutrient Management Plan.

See additional discussion regarding the potential impacts to surface waters and see various Figures in the WPDES permit application for the location of Norwegian Creek in relationship to the Heifer Facility.

3(c). Wetland Resources

No wetlands were impacted during the construction of the Heifer Facility and none will be impacted due to expansion of the Main Facility. The location of Wisconsin Wetland Inventory wetlands in the vicinity both facilities are shown on Figures 4 & 5 in the attached WPDES Permit Application.

3(d). Surface & Groundwater Resources

The WPDES permit requires zero (no) discharge from the production area of the Heifer Facility and Main Facility sites to ensure that surface water impacts do not occur. Proper manure management year-round through a Department approved Nutrient Management Plan will help reduce the risk that Norwegian Creek and Allen Creek will be affected. Larson Acres is also implementing best management practices (BMPs) on tiled fields that are landspread with manure. This includes: visual monitoring of tile lines for evidence of discharge, reduced application rates, applying higher solid content manure, planting cover crops, and performing surface tillage prior to manure application. Other practices may include constructed wetlands and tile outlet controls at a later date. The Department has the tile line proposal under review and a tile line fact sheet is attached.

The most significant possible long-term overall environmental impact to water resources is associated with the production of manure at the two sites. It is anticipated that, after expansion at the Main Facility, Larson Acres will need to store and dispose of approximately 40 million gallons of manure per year. Nutrients associated with manure can have detrimental impacts on groundwater (nitrogen) and surface waters (nitrogen and

phosphorus) if not properly land applied. Biochemical oxygen demand associated with manure can reduce dissolved oxygen levels in surface waters and kill aquatic organisms including fish. In addition, ammonia in the manure can be toxic to fish and aquatic life.

In response to concerns over potential environmental impacts of manure production and storage, Larson Acres has installed an innovative manure treatment system. As noted above, the ISS NuWay Sustainable Nutrient Management System (ISS system) separates manure into four distinct products that are effectively managed in Larson Acres' nutrient management plan. The ISS system processes manure solids into very dense, nutrient rich, solid byproducts that, when land applied, significantly reduce the potential for nutrient runoff. In addition, the ISS system creates a liquid byproduct that is extremely low in nutrients. These liquids may either be used for irrigation or if further treated, potentially discharged into surface waters. This would be subject to Department approval and would require a modification to the facilities WPDES permit under Ch. NR 243. A stream discharge is not being proposed at this time. Larson Acres has not indicated that such a request will be made.

Pursuant to NR 243.15(6), Wis. Adm., Code, Larson Acres will be seeking approval to apply, manage and utilize tea water from the ISS system through a center pivot irrigation system. Teawater will be utilized on a number of fields in the nutrient management plan through traditional land application methods; however, at this time Larson Acres is only seeking approval to spray irrigate tea water on one field. A preliminary proposal has been submitted in accordance with the WPDES permit application process. This proposal also provides information required by NR 214.14, 214.20, and 214.21, Wis. Adm. Code regarding spray irrigation systems, site investigation, and groundwater sampling. A complete set of plans and specifications have not been submitted but, are expected to be finalized and evaluated prior to Department issuance of the WPDES permit. Larson Acres is currently operating the spray irrigation system under their current nutrient management plan on a trial basis with the Department's concurrence and is being overseen by and through a grant sponsored by the University of Wisconsin-Extension. The tea water application will be made via an existing center pivot irrigation system with drop nozzles. The goal is to increase efficiency of crop nutrient utilization by applying appropriate levels of nutrients throughout the growing season.

The field selected for the tea water land application is approximately 149 acres in size and the coverage by irrigation equipment is 132 acres. The field is approximately 0.25 miles south of the Main Dairy Facility. Portions of the field have field tile installed at depth of 36 inches to 48 inches below ground surface. All tile lines outlet in one of two locations within the field.

Remote soil moisture sensors have been installed throughout the field proposed for tea water irrigation. Soil moisture sensors indicate the relative saturation of the field at any specific moment in time. This technology will assist Larson Acres and University of Wisconsin-Extension in planning tea water applications so the plant can best utilize the nutrients as well as reduce the risk that tea water will infiltrate field tiles.

The preliminary plan for the land application of tea water from a wastewater treatment system plans are being reviewed by the Department as part of the WPDES permit process. This project is being supported by a grant through the University of Wisconsin Extension.

Larson Acres is currently sampling the tea water for nutrients and will continue the sampling. Soil sampling is also routinely conducted as part of the nutrient management plan and this will continue with respect to the dedicated spray irrigation system. Larson Acres also proposes to submit a final groundwater management plan for this system. Details regarding this plan will be required and/or addressed within the forthcoming WPDES permit (the current version of the groundwater work plan is included as an attachment to this assessment). In the work plan, Larson Acres proposes to install three groundwater monitoring wells to allow sampling groundwater under the field. Initial sampling of the groundwater monitoring wells would be on a quarterly

basis and include monitoring of groundwater levels in the wells to determine groundwater flow direction and the following analytical tests:

- Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Chloride, Total Nitrogen-Ammonia (NH₃ as N), Total Kjeldahl Nitrogen (TKN), Nitrogen-Nitrate+Nitrate, pH and Total Coliform.

Except for one small outdoor concrete lot at the Main Facility by the heifer shed, all of the cattle at Larson Acres' facilities are housed in buildings where they are totally confined. The outdoor concrete lot operates under a Department approved runoff/erosion control plan and will be abandoned in 2010, when a new feed storage bunker will be constructed in its place.

Manure or wastewater from the Main Facility animal housing buildings will be transferred to a storage facility or processed through the ISS system. All of the manure storage areas at Larson Acres' facilities have been designed to meet appropriate USDA-Natural Resources Conservation Service (NRCS) design standards to further ensure that groundwater impacts do not occur. These standards have been included in WPDES permit application Appendices E, F & I. As previously noted, the Wisconsin DNR does not anticipate any long-term nutrient impacts on wetlands or surface waters in close proximity to the Larson Acres facilities.

If not done properly, the land application of manure on area cropland may cause adverse environmental impacts. Impacts from nutrient loadings, biochemical oxygen demand, and ammonia create surface water quality concerns. Because the Larson Acres dairy operation is required to obtain a WPDES permit due to its size, landspreading of its manure is regulated in accordance with a Department approved Nutrient Management Plan. The Nutrient Management Plan can be an effective tool to proactively address possible problems that would otherwise be associated with poor manure landspreading activities. Compliance with conditions in the Nutrient Management Plan for setback distances, appropriate application rates and timing, and record keeping should result in direct benefits to the environment.

Because crops utilize more nitrogen than phosphorus, if manure is applied to the nitrogen needs of the crop on a regular basis, phosphorus soil levels will become elevated over time. In order to protect against increased phosphorus loadings to area surface waters, the proposed WPDES permit will require Larson Acres' Nutrient Management Plan to address phosphorus loadings from fields where the operation landspreads manure. The proposed WPDES permit, coupled with Larson Acres' Nutrient Management Plan, will bring Larson Acres into full compliance with the nutrient management standards articulated in ch. NR 243, Wis. Adm. Code (dated 7-07).

While phosphorus is a critical component of ensuring healthy crop growth, excessive phosphorus applied to land can make its way to surface waters where it contributes to excessive algal growth and stress on aquatic life. Larson Acres has developed field- and site-specific restrictions and practices as part of its Nutrient Management Plan. Restrictions and best management practices in the Nutrient Management Plan must take into account existing soil nutrient levels, buffers, crop rotations, and other relevant factors. Larson Acres submitted its Nutrient Management Plan to the Department for review and approval in March 2009, and submitted an update in May 2009. Specific nutrient management restrictions will also be placed in the proposed WPDES permit. These restrictions will be designed to address phosphorus impacts associated with the operation's landspread manure as well as reduce potential for nutrient loss and runoff.

Landspreading manure in accordance with an acceptable Phosphorus-based Nutrient Management Plan is advantageous to both the farmer and the environment. The nitrogen and phosphorus from the manure provides nutrients for crop growth and lowers the need for commercial fertilizer. In many instances, the net nutrient application will not change, only the type of fertilizer utilized. When manure is spread in suitable amounts and

promptly tilled into the soil, the potential of runoff causing off-site problems is minimized. The proposed WPDES permit will regulate the application rates, applied acreage, spreading techniques and other specifications through the phosphorus-based Nutrient Management Plan. Larson Acres will also be required to conduct manure and soil sampling to determine appropriate application rates, depending on soil and crop types. Despite the fact that its current WPDES permit does not require Larson Acres to do so, since 2007 the Farm has submitted a nutrient management plan designed to comply with the new NR 243 rules.”

Larson Acres has submitted a phosphorus-based Nutrient Management Plan that proposes specific restrictions that are designed to minimize the potential for delivery of phosphorus from fields that are landspread with manure and process wastewater from their operation. These restrictions include:

- Soils <50 ppm phosphorus would receive application rates for manure and process wastewater that did not exceed crops nitrogen removal
- Soils between 50-100 ppm phosphorus would receive application rates for manure and process wastewater that did not exceed crop phosphorus removal for crops to be grown over a maximum rotation length of 8 years
- Soils >100 ppm phosphorus would receive application rates for manure and process wastewater that did not exceed 50% of the crop phosphorus removal in a 4-year period and in accordance with NRCS standard 590 and NR 243 standards
- No winter spreading of liquid manure except as provided in NR 243.14 (7)
- No winter spreading of solid manure for the months of February and March
- Increased limitations on winter spreading of solid manure (excluding February and March)
- Incorporation of manure within 48 hours of application, where required
- Implementation of BMPs on tiled fields (see attached Tile Line Management Plan (Draft))
- Manure or process wastewater may not be applied:
 - in a waterway, terrace channel or any areas where there may be concentration of runoff
 - within 100 feet of downgradient navigable waters or conduits to navigable waters or equivalent approved practices
 - within 100 feet of a direct conduit to groundwater
 - within 100 feet of a private well
 - within 1000 feet of a community well
 - on fields with soils less than 24 inches depth to groundwater or bedrock
 - beyond the cropping boundaries of fields identified in the Nutrient Management Plan
 - when precipitation capable of producing runoff is forecast within 24 hours of the time of planned application
 - such that ponding or runoff from sites occurs

The Department has the authority to implement further landspreading restrictions in the WPDES permit if there are additional water quality and environmental concerns. If Larson Acres conducts landspreading in accordance with an approved Nutrient Management Plan, maintains an adequate land base for landspreading, and properly inspects and maintains manure storage facilities and runoff control systems, the threat to groundwater and surface water should be minimal under normal operating and climatic conditions.

4. Cultural Impacts

There are no known archeological or historical resources that will be impacted by the existing operation or the proposed expansion of the Main Facility (per contact with Dr. Mark Dudzik, Department Archeologist).

The site was not significantly changed in terms of type of land use as a result of the construction of the Heifer Facility. The Main Facility site is zoned for agriculture, which is the predominant land use in the area, and will not need to be changed to accommodate the proposed expansion project. However, there may be adverse indirect impacts associated with the operation, primarily related to non-agricultural uses of lands in the area. There may be decreases in land values associated with residential uses within areas zoned as agricultural due to concerns, real or perceived, associated with the operation (traffic, odors, etc.). The Department has reviewed literature regarding impacts from livestock operations on property values. The literature deals primarily with impacts from hog operations on property values, which may or may not be relevant to the proposed project. It is difficult to assess the extent or existence of such impacts on property values and these impacts are beyond the regulatory authority of the Department.

However, the area's economy will change through job creation associated with the operation and an increase in the area's tax base that will benefit the community. After completion of the Main Facility expansion project, it is estimated that Larson Acres will contribute an additional \$6 million annually to local goods and services, and sixteen additional employees will be hired.

5. Energy Impacts

The proposed expansion including construction and on-going operation will ultimately result in increased energy usage. However, this usage will not significantly impact energy supplies within the vicinity of the project. No energy recovery systems are being proposed at this time.

SECTION 3 – DNR SIGNIFICANCE EVALUATION

1. Significance of Cumulative Effects

There is a trend in the livestock industry towards larger-scale facilities of this kind. Large scale operations have rapidly become an economic necessity due to changing pricing structures and the need to reduce capital inputs while maximizing production. Economies of scale associated with CAFOs have allowed producers to increase production without increasing costs. If numerous projects of this type are proposed in the same geographic area, there is a concern that the land base available for landspreading manure could be overwhelmed. This would make a number of such projects nonviable, primarily with respect to costs associated with hauling manure long distances for landspreading. The Department is not aware of additional livestock projects of this scale in the same geographic area such that the availability of land for manure application would be inadequate.

Any future projects will be examined at the appropriate time. With each new operation or proposed expansion, cumulative effects such as impacts from manure landspreading activities are considered. Unless these facilities are poorly sited or concentrated in a small area, the cumulative impacts to the environment should not be significant.

2. Significance of Risk

At the Main Facility there is one outdoor lot that houses approximately 50 animals. This area operates with an approved runoff control plan to prevent any discharge that can negatively impact the environment. Larson Acres' erosion control practices include the use of a geotextile lined sediment basin and filter strips. All other animals at the Main Facility and the Heifer Facility are totally confined within free-stall barns and therefore discharges are not an issue at these sites. The outdoor lot will be abandoned in 2010 and the expansion will not include any additional outdoor animal lots.

All manure storage facilities at the Main Facility and the Heifer Facility are currently operated and maintained to minimize leakage for the purpose of complying with groundwater standards. The proposed WPDES permit requires all facilities to have 180 days of storage for all manure and process wastewater generated at the operation by January 1, 2010 to ensure that wastes can be properly stored and land applied in compliance with the conditions and timing restrictions of the permit.

Larson Acres has confirmed that the operation currently has at least 180 days of storage. Larson Acres will be required to maintain that level of storage as long as it operates. Larson Acres may not exceed the maximum operating level in liquid storage or containment facilities except as a result of recent precipitation or conditions that do not allow removal of material from the facility in accordance with permit conditions. The facility must maintain a margin of safety in liquid storage or containment facilities so that levels of manure, process wastewater, and other wastes placed in the storage or containment facility do not overtop, even in the event of unexpected precipitation or other weather events.

The proposed WPDES permit will require that permanent markers for the margin of safety level and 180-day level be installed by January 1, 2010. All storage facilities shall be self-monitored and inspected by Larson Acres employees weekly for cracks and corrosion and compliance with the effluent limitations. In addition, the level of material in all liquid storage and containment facilities shall be measured weekly in feet or inches above or below the margin of safety level and be emptied to the point that the 180-day level indicator is visible on at least one day between October 1 and November 30 each year.

The proposed WPDES permit requires a minimum distance of 250' between wells and manure storage facilities. The permit also contains language requiring all storage facilities to temporarily store manure to meet the intent of the performance criteria of USDA Natural Resources Service standards. The Nutrient Management Plan will address how Larson Acres will implement BMP's to meet these requirements. If any upgrading or modifications to the storage facilities are necessary, formal engineering plans and specifications must be submitted to the Department for approval.

Larson Acres must comply with all terms and condition of any WPDES permit issued and the associated Nutrient Management Plan. Consequently, the landspreading of manure should not yield any substantial increase in risk to the environment. Larson Acres' Nutrient Management Plan will manage acres that may not have previously been managed in accordance with a nutrient management plan, which could mean environmental improvements resulting from more stringent nutrient management requirements as compared to existing manure application practices. The proposed WPDES permit requires that no liquid manure be spread during the winter on frozen and snow covered ground and no solid manure be spread under the same conditions during the months of February and March. Since cold weather and frozen fields pose the highest risk for manure runoff, these restrictions will significantly reduce the risk to the environment. See Adverse and Beneficial Impacts, section titled Biological Impacts, for other specific landspreading restrictions for manure and process wastewater application proposed in Larson Acres Preliminary Nutrient Management Plan.

The nutrient content of manure temporarily stored in the storage facility may vary. Unidentified variations in nutrient content may result in over-application of nutrients (nitrogen in particular) that could impact groundwater. Any WPDES permit issued to Larson Acres will require manure and soil testing to ensure this does not occur.

It is inappropriate to state the risk for water pollution from this project is eliminated entirely; the risk can only be minimized via required implementation of pollution prevention best management practices. This is the case with every WPDES permit the department issues. The WPDES permit requires the Nutrient Management Plan to be fully implemented at all times and for Larson Acres to report periods of non-compliance with the permit.

Should Larson Acres fail to comply with the WPDES requirements, it would be in violation of its permit and subject to department enforcement.

The WPDES Permit Application is provided as an attachment to this environmental assessment.

3. Significance of Unknowns

3(a). Landspreading on Tiled Fields

The Department's authority to address tile lines at CAFO's is contained in the General Requirements for nutrient management planning, NR 243.14, Wis. Adm. Code. This authority is limited to identifying tile line locations, manure/process wastewater discharges during dry conditions, and discharges during storms less than the 25-year, 24-hour rain event. Tile line sampling is typically not conducted under this code.

To prevent drainage to subsurface tile lines, Larson Acres has voluntarily included a preliminary tile line management strategy with its Nutrient Management Plan. This plan includes implementing a number of BMPs when landspreading liquid manure on tiled fields. A tile line fact sheet is attached to this Environmental Assessment for review. In summary, the tile line management strategy includes: visual monitoring of tile lines, surface tilling prior to incorporation, monitoring soil moisture, reducing application rates, and applying higher solid content manure on some tiled fields.

The Department will work with Larson Acres to review the results and best management practices. The direct relationship between point source manure/process wastewater applications and tile line water quality is currently being studied at various locations nationwide. The information obtained at Larson Acres, will assist in the nationwide effort to further understand this relationship.

3(b). Groundwater Impacts

The Town of Magnolia Groundwater Study prepared by Peter J. Taglia, P.G. dated February 2007. The purpose of this study was to evaluate information available on groundwater flow and nitrate concentrations in the bedrock aquifer in the vicinity of County Road B and Fromholtz Road near the site of the Heifer Facility. The study also aimed to investigate the shallow (unconsolidated aquifer) groundwater in the area to narrow the possible sources of nitrate to the domestic well at the Simon Yoder residence located on County Road B. This well was previously tested and showed nitrate levels from 10.3-13.1 ppm. The Town of Magnolia Groundwater addressed the groundwater quality issue in correspondence from Reynolds & Associates to DNR, August 29, 2008.

On April 10, 2007 a meeting was held in order to review the groundwater data for the Town of Magnolia. The following people attended this meeting: Jeff Postle and Lori Bowman (DATCP), Steve Ales (DNR), Fern McCoy and Dave Olson (Town of Magnolia), Ed Larson and Eric McLeod (Larson Acres), Peter McKeever (Green/Rock Citizens for Clean Water), Peter Taglia (Consultant for the Town of Magnolia), and Elizabeth Wheeler (Glen Reynolds's law office). The purpose of this review was to evaluate the available nitrate and other resource data for the Norwegian Creek Watershed in the Town of Magnolia, Rock County. From existing data collected prior to the meeting, the following conclusions were made:

- The general groundwater flow direction in the shallow bedrock aquifer is generally to the southwest.
- The groundwater affecting the private wells in the study area probably originated fairly close to the wells and the groundwater quality probably reflects local land use.
- Wells with concentrations of nitrate-N above 10 ppm are located on both sides of Norwegian Creek so it is likely that there are multiple source areas.

- The elevated nitrate results in private wells can not be conclusively attributed to specific sources of nitrate based on existing information.
- There is not enough data to statistically conclude that nitrate levels are increasing in the study area. However, two of the wells with longer term sample records have shown an increase in nitrate levels over the last 10-15 years.
- It is probably not possible to determine statistically whether the nitrate contamination in the wells in the study area is better or worse than Rock County or Wisconsin as a whole. Qualitatively the observed results are similar to many agricultural areas in Wisconsin.

Further recommendations and information can be found in the Review of Groundwater Data, prepared by Jeff Postle (DATCP), Steve Ales (DNR), and Chuck Warzecha (DHFS).

An article in the July 26, 2009 Wisconsin State Journal, notes that historic and ongoing groundwater contamination concerns are prevalent throughout Rock County and are not limited to the area immediately surrounding Larson Acres. The article is attached to the EA.

3(c). Antibiotic Use and Pathogens

There are currently no drinking or surface water standards for antibiotics and hormones that could result from livestock operations. The use of antibiotics and hormones by CAFOs is a growing public health concern. The U.S. Environmental Protection Agency (USEPA) recognizes the need to improve manure management practices at CAFOs. A number of other U.S. governmental entities including: USEPA, U.S. Department of Agriculture (USDA), U.S. Geological Survey (USGS), and Centers for Disease Control and Prevention have also recognized the need for control of pathogens at CAFOs and have undertaken research and surveillance aimed at improving the outcomes for public health and welfare in the U.S. The USEPA has listed a number of recommendations for continued research and changes in policy in the attached document titled: "Detecting and Mitigating the Environmental Impact of Fecal Pathogens Originating from Confined Animal Feeding Operations: Review".

Though there are currently no standards for pathogens, antibiotics, and hormones for CAFOs, the proposed WPDES permit requires zero (no) discharge from the production area. Most of the animals at this operation are totally confined, significantly reducing the risk of contaminated runoff. The only outside lot is at the Main Facility which has a Department approved runoff control system. Also, a Department approved nutrient management plan requires that manure application rates be dependent on crop nutrient need. There is a risk of pathogen transfer from manured land to surface waters and ground waters through runoff into tile lines and karst features. There are no known karst features on or near Larson Acres facilities, and Larson Acres is working with the Department to develop a Tile Line Management Plan to reduce the risk of runoff from the tiled fields that are landspread with manure. These BMPs do not reduce pathogens, but do reduce the risk of pathogen transfer from the dairy operation.

3(d). Manure Storage and Runoff Controls

Larson Acres existing manure storage facilities and runoff control systems are being evaluated by the DNR. The Department is reviewing all existing manure storage facilities to verify that they were built in accordance with currently accepted standards and are operating in compliance with all applicable rules and regulations. If the Department later determines that any waste storage facility fails to meet current standards, Larson Acres will be required to upgrade the facilities to meet current standards in accordance with a schedule in the proposed WPDES permit.

Larson Acres' engineering consultants, CRA, performed an engineering review of all existing facilities and

structures at Larson Acres. CRA found all existing facilities in compliance with applicable technical standards. CRA's engineering review is included as part of Larson Acres' WPDES permit reissuance application. The Department has not completed the review of these documents.

Current regulations require that there be no discharge of pollutants from any manure storage facilities, outdoor animal lots, composting and leachate containment systems, milking center wastewater treatment/containment systems, raw material storage areas, or other area of the operation to navigable waters, except in the event a 25-year, 24-hour rainfall event, or where a chronic rainfall event causes a discharge of pollutants to navigable waters from a facility, structure, or area which is properly designed for a 25-year, 24-hour rainfall event. In addition, current regulations prohibit (1) overflow of manure storage facilities, (2) direct runoff from a feedlot or manure storage facility to waters of the state, (3) unconfined manure piles/stacks in water quality management areas, and (4) unlimited access by livestock to waters of the state in locations where high concentrations of animals prevent maintenance of adequate sod cover. See the Significance of Risk section above for additional discussion on Nutrient Management Plan requirements.

Possible operating problems that could impact the environment include the failure of manure handling and storage facilities, or improper land application practices that lead to nutrient runoff to surface waters or leaching of nutrients to groundwater. The Department's evaluation of existing manure storage facilities, its review and approval of any proposed manure storage facilities, and its review and approval of Larson Acres nutrient management plan will make it highly unlikely that any storage facility would fail or that improper land application would occur.

Larson Acres implemented a Department approved Emergency Response Plan in 2007 to address small-scale manure spills. The Emergency Response Plan is part of the overall operation and maintenance plan for the facility. This plan addresses spills associated with general operation and maintenance of the dairy operation. Small spills that occur as a result of the general operations often do not create an immediate environmental impact, but they do need to be addressed by Larson Acres (e.g., scraping areas where small amounts of "spilled" manure have collected, changing operating procedures to avoid small "spills"). These response actions help ensure that impacts to waters of the state, primarily through runoff resulting from storm events, do not occur.

The Department is aware of two manure spills associated with the Larson Acre operation in 2002 and 2007. Both spills were addressed and the appropriate remedial actions were conducted. No impact from these spills is known to have occurred.

A massive failure of a manure storage facility would likely be formally defined as a spill under ch. NR 706, Wis. Admin. Code. Chapter NR 706 describes requirements for immediate notification of the Department in the case of a spill. A requirement to follow ch. NR 706 is included in the proposed WPDES permit. Inappropriate or inadequate responses (i.e., time frame of response and action taken to eliminate or mitigate environmental impact) to spills and associated environmental impacts are subject to Department enforcement. However, Department and Larson Acres action will depend on a case-by-case evaluation of actual environmental impacts and corrective actions taken by Larson Acres.

Department inspections based on complaints or general compliance efforts will help the Department evaluate whether Larson Acres is properly addressing minor "spills." In addition, Larson Acres will be required to conduct regular inspections of storage facilities to ensure that more significant problems are addressed prior to any sort of massive facility failure.

3(e) Surface Water Impact (Norwegian Creek)

The Department was provided a summary of information on a sampling program in the Norwegian Creek area. The surface water and tile line sampling was conducted in November of 2006. This information shows elevated concentrations of Nitrates. This is an area adjacent to the Heifer Facility, is in an area where Larson Acres has spread manure in the past, and it is included in their nutrient management plan for future landspreading. The drainage area for this stream and the sampling project is a complex system with several contributing sources. The area includes many different fields, tile lines and two feeder streams. Since the submitted data covers a short time frame and happened several years ago, determining exactly what occurred to create these results would be a difficult task. The following items will be addressed as part of the permit issuance process.

- The Nutrient Management plan and the best management practices covering this area will be reviewed to insure that these fields are being managed consistently with the nutrient management requirements in NR 243, Wis. Adm. Code and NRCS Technical Standard 590. Requirements in the recently revised NR 243 nutrient management section are designed to address concerns with landspreading practices and better protect surface water. A review as to the need for additional requirements will be completed.
- The need for additional monitoring and observations will be assessed. The nutrient management plan for the farm includes the best management practices from the tile line management plan. This tile line management plan includes visual monitoring of tile lines during and after manure applications on fields that have known tile lines, additional tillage practices/equipment, application scheduling, and field/weather monitoring. The nutrient management plan and the tile line management plan are currently being reviewed for approval. They will also be evaluated to assess the needs for additional requirements.
- The Department will continue periodic stream sampling and evaluations and will evaluate the need to conduct additional stream sampling.
- The need to include specific management practices or monitoring requirements for this area in the permit will be evaluated.

4. Significance of Precedent

All future projects will be evaluated by their own specific adverse and beneficial impacts. There are 185 permitted CAFOs in Wisconsin, including 2 in Rock County. Each individual project is considered separately based on its own merits.

In conducting this environmental assessment, the Department primarily considered issues that fall within its regulatory authority. Larson Acres will need to apply for and receive the appropriate approvals from all involved agencies prior to operating. Permitting this operation would not foreclose future options for taking necessary actions to protect the environment (i.e., revocation, modification of the permit). In actuality, through enforcement of the WPDES permit, the Department has a means to avoid or address possible environmental impacts associated with the operation.

Pursuant to NR 243.15(6), Wis. Adm., Code, Larson Acres will be seeking approval to apply, manage and utilize tea water from the ISS system through a center pivot irrigation system. Teawater will be utilized on a number of fields in the nutrient management plan through traditional land application methods; however, at this time Larson Acres is only seeking approval to spray irrigate tea water on one field. A preliminary proposal has been submitted. This proposal also provides information required by NR 214.14, .20, and .21, Wis. Adm. Code regarding spray irrigation systems, site investigation and groundwater sampling. A complete set of plans and specifications have not been submitted. Larson Acres is currently operating this system under their current

nutrient management plan on a trial basis in conjunction with University of Wisconsin Extension. The tea water application will be made via an existing center pivot irrigation system with drop nozzles. The goal is to increase efficiency of crop nutrient utilization by applying appropriate levels of nutrients throughout the growing season.

The field selected for the tea water application is approximately 149 acres in size and the coverage by irrigation equipment is 132 acres. The field is approximately 0.25 miles south of the Main Dairy Facility. Portions of the field have field tile installed at depth of 36 inches to 48 inches below ground surface. All tile lines outlet in one of two locations within the field.

Remote soil moisture sensors have been installed throughout the field proposed for tea water irrigation. Soil moisture sensors indicate the relative saturation of the field at any specific moment in time. This technology will assist Larson Acres and University of Wisconsin-Extension in planning tea water applications so the plant can best utilize the nutrients as well as reduce the risk that tea water will infiltrate field tiles.

Larson Acres is currently sampling the tea water for nutrients and will continue the sampling. Soil sampling is also routinely conducted as part of the nutrient management plan and this will continue with respect to the dedicated spray irrigation system. Larson Acres also proposes to submit a final groundwater management plan for this system. Details regarding this plan will be required and/or addressed within the forthcoming WPDES permit (the current version of the groundwater work plan is included as an attachment to this assessment). In the work plan, Larson Acres proposes to install three groundwater monitoring wells to allow sampling groundwater under the field. Initial sampling of the groundwater monitoring wells would be on a quarterly basis and include monitoring of groundwater levels in the wells to determine groundwater flow direction and the following analytical tests:

- Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Chloride, Total Nitrogen-Ammonia (NH₃ as N), Total Kjeldahl Nitrogen (TKN), Nitrogen-Nitrate+Nitrate, pH and Total Coliform.

The preliminary plan for the application of tea water from a wastewater treatment system plans are being reviewed by the Department as part of the WPDES permit process. This project is being supported by a grant through the University of Wisconsin Extension.

5. Significance of Controversy over Environmental Effects

Public controversy has been generated as a result of the proposed permitting of this operation. Area citizens have expressed concerns about the environment, such as possible water quality issues. Specifically, issues have arisen over the potential impacts of tile line discharges to Norwegian Creek, potential impacts to wells and the groundwater aquifer down gradient from the Heifer facility, and the capability of the farming and nutrient management practices employed by Larson Acres to protect local ground and surface water. These issues are addressed by the issuance of the proposed WPDES permit, and have been addressed in this assessment.

Area citizens have also expressed concerns about the environment such as possible air and water quantity issues. The Department has some authority to address odor complaints should they arise. As noted in the sections above, the Department is starting a process to study and address odor and air toxics issues from livestock operations on a statewide basis. This study is expected to develop standards and voluntary best management practices to reduce or minimize potential problems from CAFOs. Water quantity issues are addressed to a certain extent if the operation is required to obtain a high capacity well approval. However, neither of these issues is addressed by the issuance of the proposed WPDES permit, which is strictly intended to address the water quality concerns.

There may also be socio-economic concerns such as animal treatment issues, the trend towards large-scale farming in the state, potential impacts that larger-scale farming may have on the viability of smaller operations, and concerns of smaller operations and non-farming rural inhabitants regarding changes in the agricultural landscape associated with CAFOs. The socio-economic issues are difficult to quantify and there is significant disagreement as to the validity of these concerns. These socio-economic issues are beyond the scope of the proposed WPDES permit and the Department's overall regulatory authority. At this point, these issues can be addressed through local zoning and through implementation of comprehensive land use planning by the local unit of government.

SECTION 4 - ALTERNATIVES

Briefly describe the impacts of no action and of alternatives that would decrease or eliminate adverse environmental effects. (Refer to any appropriate alternatives from the applicant or anyone else.)

1. Facility Expansion Alternatives

The applicant studied three other alternatives before deciding to expand at the Main Facility.

Alternative #1: No expansion, keep the operation as is. Fewer animals could create less potential impact on the environment, but the expansion will allow Larson Acres to operate more efficiently. For example, because of lack of animal housing space, Larson Acres currently sells approximately 200 animals on the open market before they reach adulthood. Without the expansion, Larson Acres would be unable to hire more employees, and unable to contribute more to the local economy. The expansion will allow for greater capital investment for the purchase and implementation of technology that can mitigate potential impacts from the increase in animal numbers at the site.

Alternative #2: Expand at the Heifer Facility. This option was considered, however, it was dismissed because of the location of that facility. Locating the proposed expansion at the Heifer Facility would have resulted in lactating animals at two different sites. This would require more feed storage, runoff control and manure storage at both sites, and would increase traffic due to traveling back and forth from each site.

Alternative #3: Build a new dairy facility at a different location. Building a new dairy facility at a new location was considered, however, this option was dismissed for a number of reasons. Locating a new dairy facility at another site would require an entire new infrastructure for the farm including animal housing, milking parlor, feed storage, waste storage, manure treatment, new farm equipment, etc. This option would increase costs and decrease efficiency of the farm operation by spreading the expertise of the management team over more business entities. This option would also cause more land disturbance for construction of a new facility as it would require approximately 100 additional acres of land.

Alternative # 4: Expansion of the operations at the Main Facility as proposed. This is the best option because the expansion will utilize the current manure storage and the ISS manure treatment system. This site is located far enough away from Allen Creek and already has waterways and buffer strips in place to help protect the creek from runoff at the Main Facility. The feed storage and other necessary equipment are already in place at the Main Facility, and all of the lactating animals will be at one site. In addition, all of the dry cows will be at this site after the expansion - this will help in calving ease by not having to move the cattle during the pregnancy.

2. WPDES Permit

Within the constraints of the Department's existing permitting authority for CAFOs, the Department has limited alternatives to the issuance of a WPDES permit for the Larson Acres operation. Based on the information available to the Department, the Department cannot justify denial of the proposed WPDES permit for the operation since it is expected that the operation will comply with the conditions of the proposed permit and will not cause an exceedance of water quality standards. The Department could require more stringent conditions in the permit if it determined the conditions were necessary to protect water quality. The Department will use the information collected as part of the environmental analysis as well as part of the public comment period associated with the issuance process of a WPDES permit to make its final determination on issuance of the permit and to determine if additional restrictions in the proposed permit are necessary.

3. Evaluation of Existing Facilities

The Department's alternatives when evaluating existing runoff control and/or manure storage facilities either as part of processing a permit or the permit itself are:

- Determined that the facilities meet current standards and require no further action on behalf of the operation.
- Determined that the facilities do not meet current standards and allow the operation the option of abandoning the structure, upgrading the facility, replacing the structure or require long-term groundwater monitoring around the structure (with possible future upgrades depending on the results of the monitoring).

The selected alternative will be based on the information collected as part of this environmental analysis and further Department review.

SECTION 5 - SUMMARY OF ISSUE IDENTIFICATION ACTIVITIES

The list below includes agencies, citizen groups and individuals contacted regarding the project (include DNR personnel and title) and summarize public contacts, completed or proposed.

- Ed Larson - Larson Acres Owner
- Mark Cain - DNR Wastewater Engineer
- Nikki Weinberg - DNR Wastewater Specialist
- Eric Heggelund - DNR Wastewater Specialist
- Mike Sorge - DNR Water Resources Management Specialist
- Jim Amrhein - DNR Water Resources Management Specialist
- Cathy Bleser - DNR Regional Ecologist
- Mark Dudzik - DNR Archaeologist
- Bob Hansis - DNR Basin Supervisor
- Steve Ales - DNR Drinking and Groundwater Team Supervisor
- Terry Donovan - DNR Water Resources Engineer
- Mike Halsted - DNR Environmental Analysis Specialist
- Russ Anderson - DNR Environmental Analysis and Review Supervisor.
- Jeff Postle - DATCP
- Lori Bowman - DATCP

- Fern McCoy - Town of Magnolia Chair
- Dave Olson - Town of Magnolia
- Michael Murray - DATCP Livestock Facility Citing Program Manager
- Joseph Schurhammer - DVM of Rock County Health Department
- Peter McKeever - Green/Rock Citizens for Clean Water
- Peter Taglia - Consultant for Town of Magnolia
- Tom Sweeney – Rock County Land Conservation Department
- Elizabeth Wheeler - Glen Reynolds's Law Office
- Bob Pofahl - Design Engineer
- Jen Keuning, Contestoga Rovers & Associates
- Dave Crass, Michael Best & Friedrich
- Anna Wildeman, Michael Best & Friedrich
- Jim Leverich – UW Extension
- Dr. Tom Cox – UW-Madison
- Mike Larson – Larson Acres
- Sandy Trustem – Larson Acres
- Eric Galdi - Nutrient Management Consultant
- Tony and Dela Ends - Neighbor
- Stephen and Lea Watson - Neighbor
- John and Linda Adams - Neighbor
- Michael and Anne Johnson - Neighbor
- Anna Richmond - Neighbor
- Richard and Darlene Massen - Neighbor
- Verne and Rosemary Wilke - Neighbor
- Suellen Thomson-Link - Neighbor
- Jerry and Ellyn Popanz - Neighbor

The proposed WPDES permit for the operation will be public noticed for comments as part of the permit issuance process. An informational hearing will be held on the proposed WPDES permit to receive additional comments.

Record of Decision on next page.....

DECISION (This decision is not final until certified by the appropriate authority)

In accordance with s. 1.11, Stats., and ch. NR 150, Wis. Adm. Code, the Department is authorized and required to determine whether it has complied with s. 1.11, Stats., and ch. NR 150, Wis. Adm.. Code.

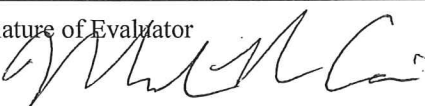
Complete either A or B below:

A. EIS Process Not Required X


The above analysis of the expected impacts of this proposal is of sufficient scope and detail to conclude that this is not a major action which would significantly affect the quality of the human environment. In my opinion, therefore, an environmental impact statement is not required prior to final action by the Department on this project.

B. Major Action Requiring the Full EIS Process _____

The proposal is of such magnitude and complexity with such considerable and important impacts on the quality of the human environment that it constitutes a major action significantly affecting the quality of the human environment.

Signature of Evaluator 	Date Signed 8/14/09
Noted: Regional Staff Specialist or Bureau Director	Date Signed

Number of responses to news release or other notice: 63

CERTIFIED TO BE IN COMPLIANCE WITH WEPA	
Regional Director or Director of BISS (or designee) 	Date Signed 8-14-09

NOTICE OF APPEAL RIGHTS

If you believe you have a right to challenge this decision made by the Department, you should know that Wisconsin statutes, administrative codes and case law establish time periods and requirements for reviewing Department decisions.

To seek judicial review of the Department's decision, sections 227.52 and 227.53, Stats., establish criteria for filing a petition for judicial review. Such a petition shall be filed with the appropriate circuit court and shall be served on the Department. The petition shall name the Department of Natural Resources as the respondent.